

**MATH 9101 - SEMINAR IN ANALYSIS: OPERATOR ALGEBRAS AND
ACYLINDRICALLY HYPERBOLIC GROUPS - SPRING 2021**

Instructor: Jesse Peterson

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Office: Zoom meeting ID: 712 106 4339

Office Hours:

Mondays 3:50 pm - 5:20 pm

Wednesdays 11:00 am - 12:00 noon

Or by appointment

Prerequisites: Real Analysis (MATH 6100, MATH 6101), and Functional Analysis (MATH 7120). A course in Operator Algebras (MATH 8120) is recommended.

Course resources: Class notes will be provided. In addition, selected topics from the following textbooks will be addressed.

Nathanial P. Brown and Narutaka Ozawa, C^* -Algebras and Finite-Dimensional Approximations, American Mathematical Society, Providence, Rhode Island, 2008.

Vern Paulsen, Completely Bounded Maps and Operator Algebras, Cambridge University Press, Cambridge, UK, 2002.

Description:

This course will be a study of operator algebras (C^* and von Neumann algebras) associated to actions of groups on hyperbolic spaces. The following topics will be addressed, with an emphasis on the setting of hyperbolic or acylindrically hyperbolic groups:

- (Inner-)amenability
- Bi-exactness
- Properly proximality
- Topologically amenable actions
- Schur and Herz-Schur multipliers
- Weak amenability
- (Quasi-)cocycles

We will also discuss some recent applications of these topics to von Neumann algebras, discussing properties such as primeness, solidity, absence of Cartan subalgebras, and strong solidity.

The topic of this course is related to the NSF FRG Grant-1853989. In connection to this there may be, on occasion, a guest lecture or discussion section involving mathematicians and/or students from the University of Iowa or UC San Diego.

Lecture format:

The lectures will be MWF 3:00pm-3:50pm, January 25th-April 30th, with no breaks. The lectures will take place over Zoom: Meeting ID: 941 4756 2219. Email the instructor for the password.

Grades:

Grades will be based on class attendance/participation and sporadic assignments.

Make-up policy:

There will be no make-up assignments. The attendance and make-up policy will follow the guidelines set forth by the College of Arts and Sciences.

Academic integrity:

You will all be held to the standards set forth in the Student Handbook.